NTSB | National Transportation Safety Board

Multivehicle Crash at Signalized Intersection

North Las Vegas, Nevada
January 29, 2022

Virtual Board Meeting Staff Participants

Brian Curtis	Deputy Managing Director (MD)
Robert Molloy, PhD	Director, Office of Highway Safety (OHS)
Ellen Lee, PE	Project Manager (OHS)
Brian Bragonier	Lead Investigator (OHS)
Bob Squire	Technical Reconstructionist / Highway Factors (OHS)
Turan Kayagil, MD	Medical Officer (RE)
Jana Price, PhD	National Resource Specialist (RE)
Julie Perrot	Safety Recommendation Specialist (SRC)

Virtual Board Meeting Staff Participants

Kathryn Catania	Deputy Director, Safety Recommendations and Communications (SRC)
William T. McMurry, Jr.	General Counsel (GC)
Casey Blaine	Deputy General Counsel (GC)
Barbara A. Czech	Director, Office of Research and Engineering (RE)
Tom Barth, PhD	Chief, Special Investigations Branch / Audio-Visual (OHS)
Lisandra Garay-Vega, PhD	Chief, Report Development Division (OHS)
Monica Mitchell	Editor (OHS)

Virtual Board Meeting Production

James Anderson	Audio Visual Production (SRC)
Deidra Esters	Management Support Specialist (MD)
Kelley Romeo	Enterprise Architect (CIO)
Rahiq Syed	Enterprise Architect (CIO)
Carl Perkins	Management Information Specialist (MD)

NTSB | National Transportation Safety Board

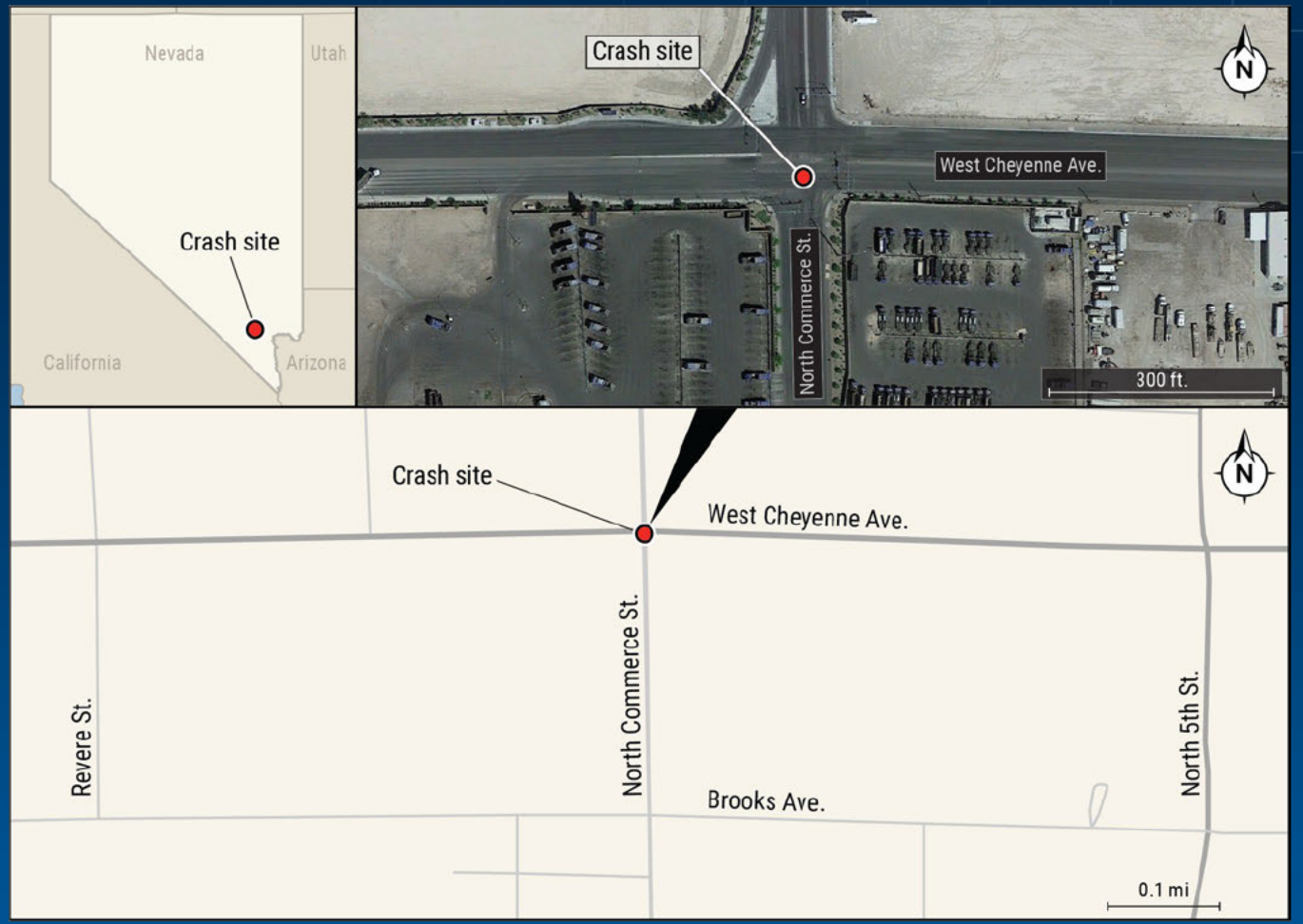
North Las Vegas, Nevada
January 29, 2022

Brian Bragonier
Lead Investigator

Crash Information and Location

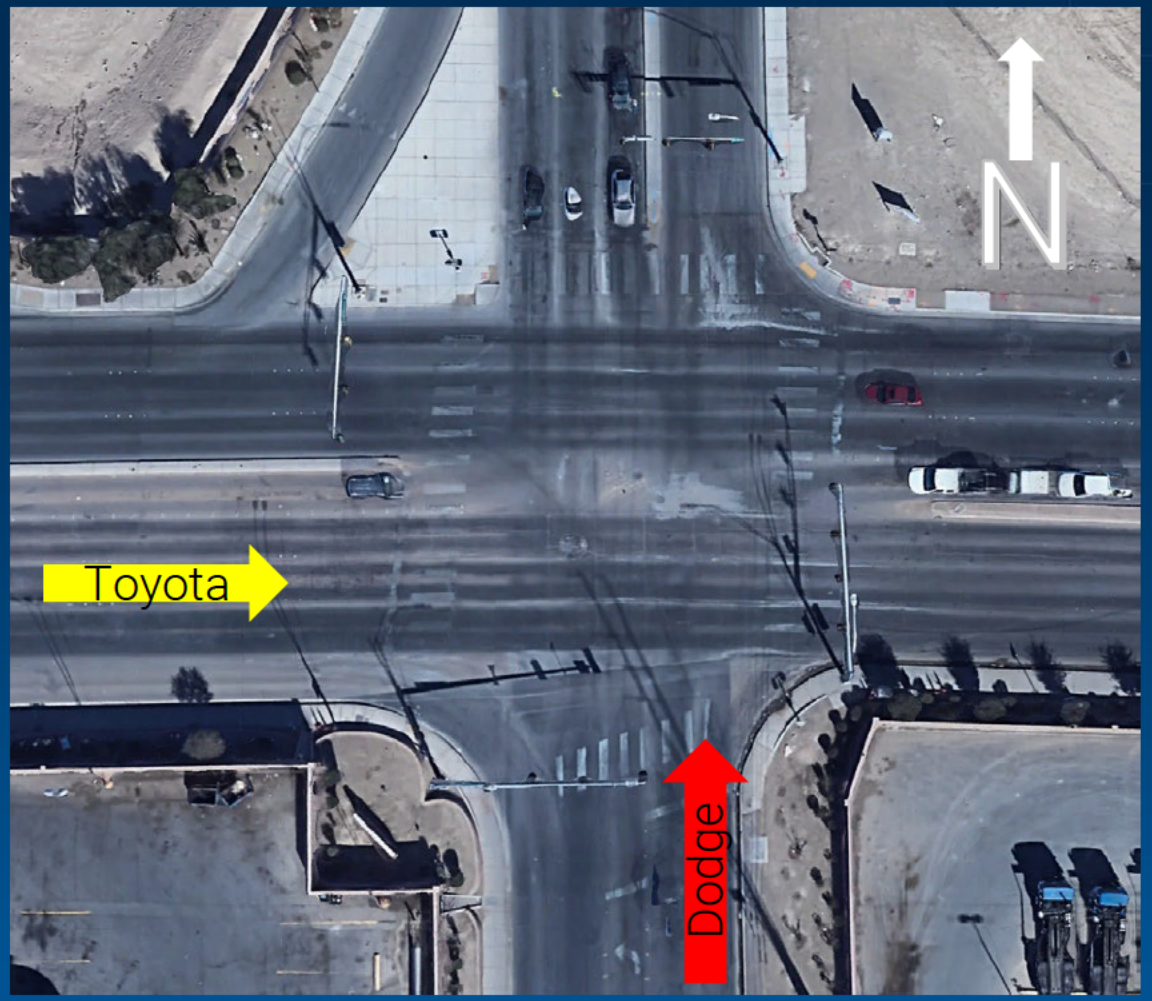
January 29, 2022

- Intersection of North Commerce Street and West Cheyenne Avenue
  - Dodge Challenger traveling northbound on North Commerce
  - Increasing speed as it approached intersection
  - Traffic signal red for 29 seconds



Source: Google Earth, HERE, ESRI, NTSB overlay

Crash Location



Source: Google Earth – NTSB overlay

Crash Information and Location

- Dodge Challenger increasing speed until impact
- Impact at 103 mph
- Did not apply brakes
- Red traffic signal

Source: Google Earth, NTSB overlay

NTSB

Crash Information and Location

- Dodge Challenger driver's view of intersection
- Straight road
- No sight obstructions
- Signal could be seen for at least 3,500 feet

Source: NTSB

Crash Vehicles

2013 Toyota Sienna

2018 Dodge Challenger

Source: NTSB

Crash Vehicles

- 2018 Dodge Challenger (northbound)
- 2013 Toyota Sienna (eastbound)
- 2016 Ford Fusion (eastbound)
- 2016 Hyundai Tucson (westbound)
- 2005 Chevrolet Malibu (westbound)
- 2021 Mercedes GLE 350 (westbound)

Injury Table

Vehicle	Fatal	Serious	Minor	None	Total
2018 Dodge Challenger	2	--	--	--	2
2013 Toyota Sienna	7	--	--	--	7
2016 Ford Fusion	--	1	--	--	1
2005 Chevrolet Malibu	--	--	--	2	2
2016 Hyundai Tucson	--	--	1	--	1
2021 Mercedes GLE 350	--	--	--	2	2
TOTAL	9	1	1	4	15

On-Scene and Investigative Staff

Thomas Chapman	Board Member
Ivan Cheung, PhD	Special Assistant
Brian Bragonier	Lead Investigator
Robert Squire	Technical Reconstruction/Highway Factors
Ellen Lee, PE	Project Manager/Survival Factors
Tom Barth, PhD	Survival Factors
Derek Freckleton	Transportation Disaster Assistance Specialist
Jennifer Gabris	Public Affairs Specialist
Peter Knudson	Public Affairs Specialist
Turan Kayagil, MD	Medical Officer
Mary Pat McKay, MD	Medical Officer (Retired)

Report Development Staff

Ellen Lee, PE	Project Manager
Monica Mitchell	Editor
Julie Perrot	Safety Recommendation Specialist
Christy Spangler	Graphics

Parties to the Investigation

North Las Vegas Police Department (NLVPD)

Excluded Factors

- Mechanical condition of the Dodge
- Actions of other drivers
- Weather and visibility
- Emergency response was timely and adequate

Safety Issues

- Preventing drug-impaired driving
- Need for technology to prevent speeding
- Need for countermeasures for repeat speeding offenders

Staff Presentations

Turan Kayagil, MD	Dodge driver's drug impairment
Ellen Lee, PE	Prevention of drug-impaired driving and excessive speed
Brian Bragonier	Repeat speeding offenders

NTSB | National Transportation Safety Board

Dodge Driver Drug Impairment

Turan Kayagil, MD
Medical Officer

Overview

- Toxicology results
- Descriptions of cocaine and phencyclidine (PCP)
- Dodge driver impairment

Toxicology Results

Substance	NMS Labs (Blood)	FAA Forensic Sciences Laboratory (Blood)
Cocaine	390 ng/mL	394 ng/mL
Phencyclidine (PCP)	27 ng/mL	19 ng/mL

- Cocaine and PCP found in liver tissue and urine
- Benzoylecgonine (cocaine metabolite) found in blood, liver tissue, and urine
- Ecgonine methyl ester (cocaine metabolite) found in blood and liver tissue
- Levamisole (additive in some illicit cocaine) found in blood, liver tissue, and urine
- Other detected substances included gabapentin (potentially impairing prescription medication)

Cocaine: Description and Effects

- Schedule II Controlled Substance
- Central nervous system stimulant
- May be used by a variety of routes
- Early effects: euphoria, excitation, general arousal, dizziness, increased focus, alertness
- Higher doses: psychosis, confusion, fear, antisocial behavior, aggressiveness
- Late effects: depression, agitation, drug craving, sedation, fatigue, insomnia

Cocaine: Driving and Levels

- Effects on driving most commonly include speeding, loss of control, high-risk behavior, poor impulse control, aggression, and inattention
- Fatal crash risk is increased
- After a single dose of cocaine, its peak level in blood typically averages 200–400 ng/mL
- Cocaine levels do not directly predict impairment, due to factors including tolerance and possible decrease in the cocaine level within a blood specimen after collection
- Dodge driver had cocaine detected at 394 ng/mL in his blood by the FAA Forensic Sciences Laboratory

PCP: Description and Effects

- Schedule II Controlled Substance
- Hallucinogen
- May be used by a variety of routes
- Effects are dose-dependent: agitation, bizarre/violent behavior, feelings of invulnerability, disorientation, distorted perception, disordered thinking, diminished coordination

PCP: Driving and Levels

- In one study, blood levels of PCP associated with arrests for erratic driving ranged from 10 ng/mL to 188 ng/mL
- PCP levels do not directly predict impairment
- Dodge driver had PCP measured at 19 ng/mL in his blood by the FAA Forensic Sciences Laboratory

What We Found: *Dodge Driver Impairment*

- The Dodge driver's driving behavior at the time of the crash was consistent with some of the known signs of impairment from cocaine and PCP, such as aggression, poor impulse control, and risk-taking behavior.
- **The Dodge driver was impaired by effects of cocaine and PCP at the time of the crash**.

NTSB | National Transportation Safety Board

Prevention of Drug-Impaired Driving and Excessive Speed

Ellen Lee, PE
Project Manager

Overview

- Dodge driver's actions
- Drug-impaired driving prevention
- Traditional countermeasures for speeding
- Intelligent speed assistance (ISA) overview
- Addressing barriers to ISA implementation

Dodge Driver's Actions

NTSB

Drug-Impaired Driving

- Impaired driving is a significant nationwide problem
- Extent of driving while impaired by drugs other than alcohol is not well understood
- In 2022, NTSB published a safety research report examining impaired driving and issued several recommendations
- H-22-39 issued to states to complete an assessment using the National Highway Traffic Safety Administration's (NHTSA) Drug-Impaired Driving Criminal Justice Evaluation Tool
  - Tool examines all facets of a state's drug-impaired driving program

Drug-Impaired Driving

- In 2023, at Nevada's request, NHTSA assessed Nevada's impaired-driving program
  - Assessment determined strengths, weaknesses, and recommendations for improvement
- Nevada published an Impaired Driving Program Plan (Nevada Office of Traffic Safety, 2023) and has begun moving forward on key recommendations from the assessment

What We Found: *Drug-Impaired Driving*

- Nevada has taken recent steps to reduce impaired driving, conducting a program assessment and developing and implementing an impaired-driving program plan
- NTSB classified H-22-39 Closed—Acceptable Alternate Action for Nevada

Traditional Countermeasures for Speeding

- Speeding is one of the most common factors causing crashes
- Traditional countermeasures: engineering, education, enforcement
  - Nevada's 2022 Speed Management Action Plan identifies actions being taken in each of these categories
- Dodge driver traveling 3 times the speed limit
- Traditional countermeasures not effective in this crash
  - Driver was impaired and exhibited pattern of high-risk speeding behavior
  - North Commerce Street had no indication of a speeding problem

Intelligent Speed Assistance (ISA) Overview

- ISA is designed to prevent drivers from exceeding speed limits
- Two types
  - Passive: warns driver when speed limit exceeded
  - Active: electronically limits speed
- Research shows that both passive and active systems offer clear safety benefits
- In this crash, an active system may have mitigated the severity of the crash

Intelligent Speed Assistance (ISA) Overview

- ISA around the world
  - Evaluated in some international New Car Assessment Programs (NCAPs)
  - In 2022, ISA mandated in Europe
- ISA in the United States
  - Many automakers voluntarily offer optional systems
  - Not yet in NCAP or federal motor vehicle safety standards (FMVSS)
- Previous NTSB Safety Recommendation H-17-24 to NHTSA to incentivize ISA by, for example, including ISA in US NCAP (currently classified Open—Unacceptable Response)
  - Limited NHTSA action to date

Addressing Barriers to Implementation

- Federal requirement would ensure broad deployment of ISA
- Challenges to overcome:
  - Public acceptance of the technology
    - Wider voluntary deployment by automakers allow US drivers to gain experience
    - Media campaigns increase public understanding of capabilities and benefits
  - Lack of map standardization and inconsistencies in highway signs
    - Ongoing work by Federal Highway Administration to integrate highway automation into the transportation system

What We Found: *Prevent Excessive Speed*

- Dodge driver's history and specific actions showed repeated disregard for safety
- Active ISA system may have mitigated severity of this crash
- Broad deployment of ISA will reduce speeding and speeding-related crashes
- Wider voluntary deployment and strategies to improve public acceptance of ISA will facilitate development of federal safety standards
- What we propose:
  - Two new recommendations to NHTSA
  - One new recommendation to passenger vehicle manufacturers
  - Reiteration of H-17-24 to NHTSA

NTSB | National Transportation Safety Board

Repeat Speeding Offenders

Brian Bragonier
Lead Investigator

Overview

- Dodge driver's license history
  - Multiple traffic violations
  - Documented and undocumented
- Identifying repeat speed offenders
  - Inaccurate records
- Deterring repeat speed offenders
  - Technology-based countermeasures

Driving History

- Between 1984 to 2017, Dodge driver was convicted multiple times
  - Two driving under the influence (DUI) arrests
  - Five driving under suspension convictions
  - Three speeding tickets
  - One conviction each for driving without insurance, failing to obey traffic devices, and failing to signal

Driving History

- Seven speeding violations
  - Only one appeared on his official 10-year driving record (April 2017)
  - Four pled down to illegal parking

Driver's History

Date	Citation
04/26/2017	Speeding
05/17/2017	Speeding
12/25/2017– 01/08/2020	License suspended
08/29/2020	Speeding
11/18/2020	Speeding
02/03/2021	Speeding
08/25/2021	Speeding
12/09/2021	Speeding
01/29/2022	*Crash*

Identifying Repeat Offenders

- Many reasons citations do not appear on driving record
  - Delays in reporting convictions from courts to the Department of Motor Vehicles
  - Some courts do not enter a conviction until a fine is paid
  - Plea agreements
- These issues occur in many states
- Identification of problem drivers is critical because repeat speeders are more likely to cause crashes, including fatal ones

2023. *Strategies to Improve State Traffic Citation and Adjudication Outcomes*. Washington, DC: National Academies Press

Identifying Repeat Offenders

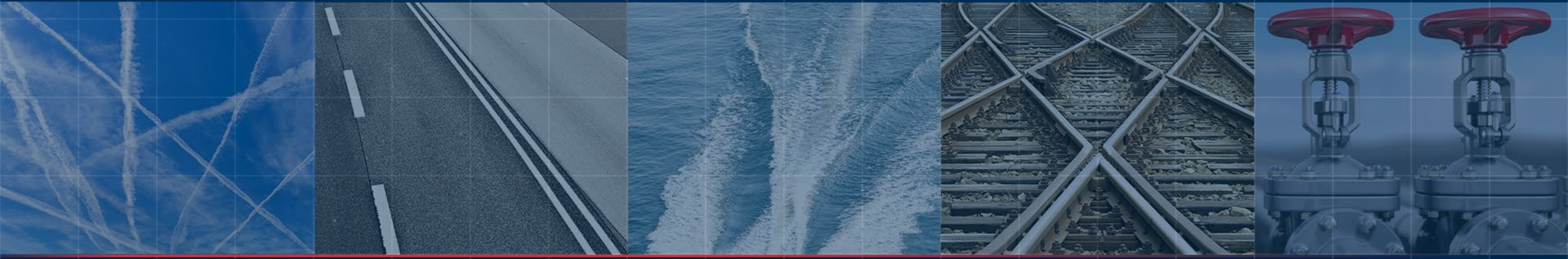
- Improve citation and adjudication tracking through a statewide electronic system
  - System should track throughout the entire legal process from the time of arrest through the final disposition (including plea agreements and reduced sentences)
- NHTSA provides substantial guidance to states regarding their highway safety plans and traffic records programs
  - Currently no guidance on identifying/tracking repeat speeding offenders

Deterring Repeat Offenders

- Repeat speeding offenders are difficult to deter using traditional methods
- Action by NHTSA and the states is needed to address this problem
  - Strategies used for repeat DUI offenders may have promise
- ISA systems may help reduce speeding among repeat offenders
  - Consider an interlock program, where an ISA device would be installed in the driver's vehicle

What We Found: *Repeat Speeding Offenders*

- Because the Dodge driver was a repeat offender, he was more likely to cause a fatal crash
- Inaccurate driver records reduce the likelihood of accurately identifying repeat offenders and electronic citation data tracking systems can help identify and track high-risk drivers
- Evidence-based countermeasures targeting repeat speeding offenders are lacking
- ISA systems have the potential to reduce speeding among repeat offenders
- What we propose:
  - Three recommendations to NHTSA
  - One recommendation to the 50 states, District of Columbia, Commonwealth of Puerto Rico



NATIONAL TRANSPORTATION SAFETY BOARD